



DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission

[Docket No. AD22-5-000]

Implementation of Dynamic Line Ratings

AGENCY: Federal Energy Regulatory Commission.

ACTION: Notice of inquiry.

SUMMARY: The Federal Energy Regulatory Commission (Commission) seeks comment on whether and how the required use of dynamic line ratings (DLR) is needed to ensure just and reasonable wholesale rates. The Commission further seeks comment on: whether the lack of DLR requirements renders current wholesale rates unjust and unreasonable; potential criteria for DLR requirements; the benefits, costs, and challenges of implementing DLRs; the nature of potential DLR requirements; and potential timeframes for implementing DLR requirements.

DATES: Initial Comments are due **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, and Reply Comments are due **[INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments, identified by docket number, may be filed in the following ways. Electronic filing through <http://www.ferc.gov> is preferred.

- Electronic Filing through <http://www.ferc.gov>. Documents created electronically using word processing software must be filed in acceptable native applications or print-to-PDF format, but not in scanned or picture format.
- Mail/Hand Delivery: Those unable to file electronically may mail comments via the U.S. Postal Service to: Federal Energy Regulatory Commission, Secretary of

the Commission, 888 First Street NE, Washington, DC 20426. Hand-delivered comments or comments sent via any other carrier should be delivered to: Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, MD 20852.

- Instructions: For detailed instructions on submitting comments, see the Comment Procedures Section of this document.

FOR FURTHER INFORMATION CONTACT:

Daniel Kheloussi (Technical Information)
Office of Energy Policy and Innovation
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426
(202) 502-6391
Daniel.Kheloussi@ferc.gov

Ryan Stroschein (Legal Information)
Office of the General Counsel
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426
(202) 502-8099
Ryan.Stroschein@ferc.gov

SUPPLEMENTARY INFORMATION: In this Notice of Inquiry (NOI), the Federal Energy Regulatory Commission (Commission) seeks comment on whether and how the required use of dynamic line ratings (DLR)¹ is needed to ensure just and reasonable wholesale rates. The Commission further seeks comment on: whether the lack of DLR requirements renders current wholesale rates² unjust and unreasonable; potential criteria for DLR requirements; the benefits, costs, and challenges of implementing DLRs; the nature of potential DLR requirements; and potential timeframes for implementing DLR requirements.

¹ A DLR is a transmission line rating that: “(1) applies to a time period of not greater than one hour; and (2) reflects up-to-date forecasts of inputs such as (but not limited to) ambient air temperature, wind, solar heating intensity, transmission line tension, or transmission line sag.” *Managing Transmission Line Ratings*, Order No. 881, *Federal Register*, 87 Fed. Reg. 2244 (Jan. 13, 2022), 177 FERC ¶ 61,179, at P 7 (2021).

² Consistent with Order No. 881, by “wholesale rates,” we refer to both rates for the transmission of electric energy in interstate commerce and rates for the sale of electric energy at wholesale in interstate commerce. *Id.* P 29.

I. Background

1. On December 16, 2021, the Commission issued Order No. 881 in Docket No. RM20-16-000. In that order, pursuant to section 206 of the Federal Power Act (FPA), the Commission revised the Commission's *pro forma* open access transmission tariff (OATT) and the Commission's regulations to improve the accuracy and transparency of electric transmission line ratings.³ Specifically, the Commission found that the use of only seasonal and static temperature assumptions in developing transmission line ratings would result in transmission line ratings that do not accurately represent the transfer capability of the transmission system.⁴ The Commission found that inaccurate transmission line ratings result in unjust and unreasonable Commission-jurisdictional rates.⁵

2. Accordingly, the Commission required, among other things and with limited exceptions: (1) transmission providers⁶ to use ambient-adjusted ratings (AARs)⁷ as the

³ *Id.* P 1.

⁴ *Id.* P 3.

⁵ *Id.*

⁶ Consistent with Order No. 881, we use transmission provider to mean any public utility that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce. 18 CFR 37.3 (2021). Therefore, unless otherwise noted, “transmission provider” refers only to public utility transmission providers. Furthermore, the term “public utility” as found in section 201(e) of the FPA means “any person who owns or operates facilities subject to the jurisdiction of the Commission under this subchapter.” 16 U.S.C. 824(e).

⁷ An AAR is a transmission line rating that: “(1) applies to a time period of not greater than one hour; (2) reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies; (3) reflects the absence of solar heating during nighttime periods where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently; and (4) is

basis for evaluation of transmission service requests that will end within 10 days of the request and as the basis for their determination of the necessity of certain curtailment, interruption, or redispatch of transmission service anticipated to occur within those 10 days; (2) transmission providers to use seasonal line ratings as the basis for evaluation of transmission service requests ending more than 10 days from the date of the request and as the basis for the determination of the necessity of curtailment, interruption, or redispatch of transmission service that is anticipated to occur more than 10 days in the future; and (3) regional transmission organizations and independent system operators (RTOs/ISOs) to establish and maintain the systems and procedures necessary to allow transmission owners in their regions to electronically update transmission line ratings on at least an hourly basis (thereby enabling the RTO/ISO to use DLRs from transmission owners that voluntarily adopt them).⁸

3. While acknowledging in Order No. 881 that, in certain situations, using transmission line ratings that are based on factors beyond forecasted ambient air temperatures and the presence or absence of solar heating—such as DLRs—may lead to greater accuracy of transmission line ratings, the Commission declined to mandate DLR implementation based on the record in that proceeding.⁹ Instead, the Commission incorporated that record on DLRs into the instant proceeding, Docket No. AD22-5-000, which the Commission opened to further explore DLR implementation.

calculated at least each hour, if not more frequently.” Order No. 881, 177 FERC ¶ 61,179 at P 4.

⁸ *Id.* PP 4-9.

⁹ *Id.* PP 7-8, 36, 252.

4. The Commission explained that, unlike AARs, DLRs are based not only on forecasted ambient air temperatures and the presence or absence of solar heating, but also on other weather conditions, such as wind, cloud cover, solar heating intensity (instead of only daytime/nighttime distinctions used in AARs), and precipitation, and/or on transmission line conditions such as tension or sag.¹⁰ The Commission agreed with commenters that highlighted the benefits to DLR implementation.¹¹ For example, the Commission agreed with the Exelon Corporation (Exelon) that there may be applications in which DLRs can provide net benefits to customers, such as when the limiting element for a transmission facility experiencing significant congestion is the conductor and conditions besides ambient air temperature have a consistent and significant impact on the power carrying capabilities of the line. The Commission also acknowledged that the use of DLRs generally allows for greater power flows than would otherwise be allowed and that their use can also detect situations where power flows should be reduced to maintain safe and reliable operation and avoid unnecessary wear on transmission equipment.¹²

5. Despite the benefits of DLR implementation, the Commission recognized that DLR implementation also presents additional costs and challenges not found in AAR implementation, such as costs associated with placement of sensors, cybersecurity, and other costs.¹³ The Commission found that the record in the Order No. 881 proceeding,

¹⁰ *Id.* P 7.

¹¹ *Id.* P 253.

¹² *Id.*

¹³ *Id.* P 254.

Docket No. RM20-16-000, was not sufficient for it to evaluate the relative benefits and costs and challenges of DLR implementation.¹⁴

II. Discussion

6. We are issuing this NOI to further explore whether DLR implementation is required to ensure just and reasonable wholesale rates. We invite all interested persons to submit comments and reply comments on any or all of the questions listed. Commenters need not answer all the questions. Commenters should organize responses consistent with the structure of the attached questions. Commenters are also invited to reference material previously filed, including in Docket Nos. RM20-16-000 and AD19-15-000, but are encouraged to avoid repetition or replication of previous material. Initial comments must be submitted on or before 60 days after the date of publication of this NOI in the Federal Register. Reply comments must be submitted on or before 90 days after the date of publication of this NOI in the Federal Register.

A. Questions on the Need for DLR Requirements

7. In Order No. 881, the Commission found that transmission line ratings directly affect wholesale rates because transmission line ratings and wholesale rates are inextricably linked.¹⁵ It explained that transmission line ratings represent the maximum transfer capability on a transmission line, which, in turn, determines the quantity of energy that can be transmitted from suppliers to load. The Commission explained that, all else equal, as transfer capability declines, wholesale rates increase. The Commission also observed that inaccurate transmission line ratings can result in underutilization (or

¹⁴ *Id.*

¹⁵ *Id.* P 30.

overutilization) of existing transmission facilities, thereby sending a signal that there is less (or more) transfer capability than is truly available.¹⁶

- Q1) As a threshold matter, even for transmission lines that incorporate AARs, is there a need to further increase the accuracy of transmission lines ratings through the implementation of DLRs to ensure just and reasonable wholesale rates? Why or why not? If yes, please explain whether a requirement by the Commission to adopt DLRs is needed.
- Q2) What, if any, barriers to DLR implementation exist today? Are potential requirements to implement DLRs necessary to address these existing barriers? Why or why not?

B. Questions on Potential Criteria for DLR Requirements

8. Commenters in the Order No. 881 proceeding expressed a range of opinions on whether and how the Commission should require the implementation of DLRs. On one end of the spectrum, Southwest Power Pool, Inc.'s Market Monitoring Unit (SPP MMU) stated that it supported a requirement for DLR implementation on all transmission lines.¹⁷ Similarly, Industrial Customer Organizations and the R Street Institute contended that DLRs should be required by default, with exceptions given when justified by cost-benefit analyses.¹⁸ On the other end, many commenters, including nearly all transmission

¹⁶ *Id.* PP 30, 34.

¹⁷ SPP MMU, Comments, Docket No. RM20-16-000, at 4 (filed Mar. 22, 2021).

¹⁸ R Street Institute, Comments, Docket No. RM20-16-000, at 3 (filed Mar. 22, 2021); Industrial Customer Organizations, Comments, Docket No. RM20-16-000, at 5 (filed Mar. 22, 2021).

owners that filed comments about DLRs, either opposed a requirement to implement DLRs on all transmission lines¹⁹ or opposed a DLR requirement in any form.²⁰

9. Other commenters supported targeted or limited DLR implementation. For example, the WATT Coalition (WATT) and Clean Energy Parties proposed criteria for requiring DLR implementation and contended that such criteria could help overcome concern about costs of DLRs exceeding benefits.²¹ Specifically, WATT proposed that the Commission require “sensor-based DLRs” on all thermally limited transmission lines rated 69 kV or greater when: (1) market congestion totaling over \$1 million has occurred within the past year; (2) the transmission line is identified as being a constraint projected to have market congestion over \$1 million over the coming three years as a part of the current RTO/ISO transmission planning cycle process, which can be economic or reliability based; (3) thermally limited transmission lines show up as limiting in generator

¹⁹ Arizona Public Service Company, Comments, Docket No. RM20-16-000, at 8 (filed Mar. 22, 2021); New York Transmission Owners, Comments, Docket No. RM20-16-000, at 2 (filed Mar. 22, 2021); Indicated PJM Transmission Owners, Comments, Docket No. RM20-16-000, at 13 (filed Mar. 22, 2021); Pacific Gas and Electric Company, Comments, Docket No. RM20-16-000, at 11-12 (filed Mar. 22, 2021).

²⁰ American Electric Power Service Corporation, Comments, Docket No. RM20-16-000, at 6 (filed Mar. 22, 2021); Dominion Energy Services Inc., Comments, Docket No. RM20-16-000, at 9 (filed Mar. 22, 2021); Entergy Services LLC, Comments, Docket No. RM20-16-000, at 14 (filed Mar. 22, 2021); Bonneville Power Administration (BPA), Comments, Docket No. RM20-16-000, at 6 (filed Mar. 22, 2021); Exelon, Comments, Docket No. RM20-16-000, at 3 (filed Mar. 22, 2021); PacifiCorp, Comments, Docket No. RM20-16-000, at 5-6 (filed Mar. 22, 2021); National Rural Electric Cooperative Association and the Large Public Power Council, Comments, Docket No. RM20-16-000, at 3 (filed Mar. 22, 2021); MISO Transmission Owners, Comments, Docket No. RM20-16-000, at 45-46 (filed Mar. 22, 2021); ITC Holdings Corp., Comments, Docket No. RM20-16-000, at 14-15 (filed Mar. 22, 2021).

²¹ WATT, Comments, Docket No. RM20-16-000, at 10-11 (filed Mar. 22, 2021); Clean Energy Parties, Comments, Docket No. RM20-16-000, at 7-10 (filed Mar. 22, 2021); American Clean Power Association and the Solar Energy Industries Association (ACPA/SEIA), Comments, Docket No. RM20-16-000, at 9-10 (filed Mar. 22, 2021).

interconnection system impact studies; or (4) generation curtailed by more than 10% on average for one year due to factors that include transmission line capacity.²²

- Q3) If the Commission were to require DLR implementation, should it require the implementation only on certain transmission lines, and, if so, what set of criteria should be considered to identify transmission lines for DLR implementation? Examples of such criteria could include congestion, curtailment levels, voltage levels, infrastructure, and/or geography/terrain. Explain why such criteria would identify the set of transmission lines on which DLRs need to be implemented in order to produce just and reasonable wholesale rates.
- Q4) How should transmission lines be evaluated for whether they satisfy such criteria, both initially and going forward? Please estimate the number and proportion of transmission lines that would likely be implicated by any criteria you recommend.
- Q5) If the Commission were to require DLR implementation based on certain criteria, should the criteria be regularly reevaluated to ensure such criteria continue to ensure accurate transmission line ratings, and, if so, at what interval(s)? How should such regular reevaluations work practically?
- Q6) If such criteria included the magnitude of congestion on a transmission line, what metrics exist that assess the magnitude of congestion in both or either RTO/ISO and/or non-RTO/ISO regions? For any congestion metrics suggested, what data sources are available?
- Q7) Implementation of the requirements adopted in Order No. 881 are expected to change congestion patterns. How should these congestion pattern changes be accounted for when considering whether a transmission line satisfies the criteria established as part of any potential DLR requirements?
- Q8) What are the differences, if any, between RTOs/ISOs and non-RTO/ISO transmission providers that the Commission should account for when considering any DLR requirements?
- Q9) If the Commission were to require DLR implementation based on certain criteria, should it require that new transmission lines be evaluated to determine whether they must implement DLRs? Are there any characteristics of new transmission lines that warrant different criteria?

²² WATT, Comments, Docket No. RM20-16-000, at 10-11 (filed Mar. 22, 2021).

- Q10) If the Commission were to require DLR implementation, how should that requirement be considered in regional transmission planning and interconnection processes?
- Q11) If the Commission were to require DLR implementation based on certain criteria, what transparency measures should the Commission require? For example, should the Commission consider requiring transmission providers to submit informational reports that show which transmission lines meet any determined criteria for DLR implementation? And/or should the Commission require transmission providers to post the same on their Open Access Same-Time Information System websites?

C. Questions on the Benefits, Costs, and Challenges of Implementing DLRs

10. While the Commission in Order No. 881 highlighted the potential benefits of DLR implementation, including potential increases in the accuracy of transmission line ratings and potentially greater power flows, it recognized that there are costs and challenges associated with DLR implementation. Some commenters in the Order No. 881 proceeding provided DLR cost estimates, but there was limited detail around those estimates and those estimates varied. For example, BPA asserted that DLR implementation would require investment of potentially over \$1 million per transmission line in monitoring equipment, software, and hardware to submit and host the data.²³ MISO Transmission Owners contended that DLR implementation could cost between \$100,000 and \$200,000 per transmission line, and thus the overall cost to implement DLRs for all transmission lines in MISO would be approximately \$1.5 billion.²⁴ SPP estimated that DLR implementation that requires an energy management system (EMS)

²³ BPA, Comments, Docket No. RM20-16-000, at 6 (filed Mar. 22, 2021).

²⁴ MISO Transmission Owners, Comments, Docket No. RM20-16-000, at 47 (filed Mar. 22, 2021) (deriving \$1.5 billion by estimating \$150,000 per line multiplied by 10,000 lines on the MISO system).

upgrade would cost transmission owners up to \$1 million and, without upgrading the EMS, DLR implementation would cost an additional \$100,000 to \$500,000 annually in additional supervisory control and data acquisition (SCADA) communications with the reliability coordinator's EMS.²⁵

Q12) For any DLR requirement criteria you identified in response to question Q3 above, please explain and, if possible, quantify the potential annual gross market benefits that would be expected to result from such a requirement.

- a) If possible, please also provide estimated upper and lower bounds on such gross market benefit estimations based on favorable and unfavorable assumptions.
- b) How might these benefits change with geography/terrain, communication infrastructure, and transmission path?
- c) To what extent might DLR implementation shift congestion to new areas? How would these shifts in congestions patterns affect the overall benefits of DLR implementation?
- d) Please describe the method and assumptions used to estimate gross market benefits.

Q13) If you have experience implementing (or evaluating the implementation of) DLRs, please describe your experience and, if applicable, explain your specific DLR design, installation, and operating decisions, choice of facilities on which to implement DLRs, the implications for reliability, and how such DLR implementation affected transmission transfer capability.

Q14) What are the expected costs and challenges of implementing DLRs (separate from the costs associated with Order No. 881 implementation)?

- a) How are these costs and challenges divided between initial implementation (e.g., sensor purchase and installation, EMS upgrades, and communications upgrades) and ongoing operations and maintenance (e.g., sensor maintenance, communications maintenance, and forecasting)?

²⁵ SPP, Comments, Docket No. RM20-16-000, at 12 (filed Mar. 22, 2021).

- b) How might these costs and challenges change with geography/terrain, communication infrastructure, and transmission path?
- c) Are there any published reports or studies assessing the costs, benefits and challenges of DLR implementation? If so, please identify and briefly describe these studies.
- d) Please identify any factors or situations that might cause DLR implementation to be prohibitively expensive, and please describe alternative implementation approaches that could limit those costs.
- e) Please describe any advantages or disadvantages related to costs and challenges to implementing DLRs concurrently with the requirements of Order No. 881 (as opposed to after Order No. 881 is implemented). For example, are the EMS and communication upgrades required to implement AARs sufficient to support the use of DLRs?

Q15) Please describe the cybersecurity challenges of DLR implementation. What are the potential impacts to reliable operations if the digital devices that monitor or communicate line conditions used for establishing DLRs are manipulated or rendered inoperable by a cyber event? What relevant procedural or technical cybersecurity controls exist that would mitigate such risk?

Q16) If the Commission were to require DLR implementation, should the Commission direct NERC to evaluate how this requirement could introduce new risks to the reliable operation of the BES and whether any standards require modification to address any risks?

D. Questions on the Nature of Potential DLR Requirements

11. DLRs are generally based on a combination of real-time measured data and various forecasts that are used to compute up-to-date transmission line ratings.

The real-time measured data is typically gathered using field located sensors.

12. In their comments in the Order No. 881 proceeding, WATT suggested a requirement that transmission providers implement “sensor-based DLRs” in certain circumstances (i.e., a requirement that transmission line ratings incorporate real-time data

from field-based sensors on weather and/or transmission line parameters, such as sag, tension or temperature).²⁶ Alternatively, transmission line ratings could be based on up-to-date forecasts of additional weather input and/or transmission line parameter values.

13. The following questions seek information regarding potential approaches for a DLR requirement.

- Q17) If the Commission required DLRs in some circumstances, would it be appropriate to require transmission providers to calculate transmission line ratings based on up-to-date forecasts of additional weather factors beyond those required in Order No. 881? Why or why not? If so, please explain what additional factors (e.g., wind speed, wind direction, solar irradiance (beyond day/night)) should be considered in transmission line rating calculations.
- Q18) To what extent would it be appropriate to rely on sensor-based measurements of line parameters²⁷ such as line sag, line tension, or conductor temperature in calculating line ratings, either in addition to, or in lieu of, forecasted weather factors described in Q17? In what circumstances should DLR approaches augment any sensor-based measurements of transmission line parameters with weather forecasts (e.g., from the National Oceanic and Atmospheric Administration or another weather service)? To what extent are sensor-based measurements of line parameters useful in determining longer-term forecasted line ratings (e.g., 2-7 days ahead), rather than just instantaneous or very short-term calculations of line ratings? How does the ability to forecast line ratings compare between DLR approaches that rely primarily upon sensor-based measurements of transmission line parameters and those that rely upon weather data?
- Q19) Should the Commission consider sensor-based DLR requirements, such as those suggested by WATT? If yes, what level of sensor coverage and performance requirements for such sensors should be required? Please explain whether the Commission would need to specify details like the types of sensors, how many are installed, what they measure, and the quality of their data? Would a sensor-focused requirement that specifies

²⁶ WATT, Comment, Docket No. RM20-16-000, at 10-11 (filed Mar. 22, 2021); ACPA/SEIA, Comments, Docket No. RM20-16-000, at 9-10 (filed Mar. 22, 2021).

²⁷ See, e.g., LineVision, Comments, Docket No. RM20-16-000, at 2-3 (filed Mar. 22, 2021).

the types of technologies potentially become stale as DLR technologies evolve? Why or why not?

- Q20) In Order No. 881, the Commission adopted exceptions from the AAR requirements to ensure the safety and reliability of the transmission system and for transmission lines with transmission line ratings that are not affected by ambient air temperature or solar heating.²⁸ Please explain whether the Commission should adopt the same or similar exceptions for DLR requirements. Are there any different/other exceptions from the application of DLR requirements that the Commission should consider? If so, what are these exceptions?
- Q21) In Order No. 881, the Commission established requirements for AARs to be applied to a period not greater than one hour and for AARs to be updated hourly.²⁹ Is this time resolution and calculation frequency also appropriate for DLR requirements or should an alternative approach be considered? Why?
- Q22) How might the Commission consider potential requirements for DLR implementation on transmission lines that are on the seam of multiple transmission provider service territories? What additional coordination between neighboring transmission owners and transmission providers, if any, might be necessary?
- Q23) In Order No. 881, the Commission required AARs to be used for near-term transmission service, defined as transmission service that ends not more than 10 days after the transmission service request date (i.e., within the next 10 days).³⁰
- a) Within what timeframes should the Commission require transmission providers to calculate transmission line ratings³¹ using DLRs (on transmission lines for which DLRs are required)? Does this depend on which DLR approach (weather-

²⁸ Order No. 881, 177 FERC ¶ 61,179 at PP 227-228.

²⁹ *Id.* PP 162, 168. *See also Pro Forma OATT* attach. M, AAR Definition.

³⁰ Order No. 881, 177 FERC ¶ 61,179 at P 86.

³¹ We clarify that we use the phrasing “require transmission providers to calculate” consistent with Order No. 881, in which the Commission clarified “that hourly (or more frequent) querying of ‘look-up tables’ or similar pre-calculated AAR databases will satisfy the requirement that AARs be calculated at least each hour.” *Id.* PP 141-142.

based or line parameter-based) is used for a particular DLR implementation?

- b) For which transmission services (*e.g.*, hourly point-to-point transmission service, daily point-to-point transmission service, weekly point-to-point transmission service, etc.) should the Commission require the use of DLRs?
- c) What data on the accuracy of forecasting wind speed, wind direction, and/or other DLR variables would support the DLR implementation timeframes and transmission services you recommend above in (a) and (b)?

Q24) If the Commission were to decide that a requirement to implement DLR is appropriate:

- a) Should the Commission limit the number or proportion of transmission elements that a transmission provider must implement DLRs on at any one time, even if such elements otherwise met the criteria for a DLR requirement? If so, should such a limit be based on a number or percentage of transmission elements, and if so, what number or percentage?
- b) Should the relevant transmission element for such a limit be considered individual transmission *lines*, or individual transmission *line-miles*, or some other unit? Or, if such a limit is necessary, would some other approach be better? Explain why you recommend any particular approach.
- c) Should such a limit be applied each time a transmission provider is required to evaluate whether DLRs need to be implemented on additional transmission lines (as contemplated below in Q29)?

Q25) If changed circumstances result in a transmission line no longer meeting the DLR criteria, should the transmission provider continue to be required to use the DLR to calculate the rating for that line? Please explain why or why not.

E. Questions on Potential Timeframes for Implementing DLR Requirements

14. In Order No. 881, the Commission required AARs to be implemented no later than three years from the compliance filing due date.³² The Commission explained that three years was consistent with the implementation schedule most commonly suggested by transmission owners for AAR implementation on priority transmission lines and that three years would be sufficient time for transmission owners and transmission providers to implement changes to their processes and systems to comply with the requirements adopted in the final rule.

Q26) What would be the appropriate amount of time, either from your experience or by your estimation, necessary for each of the following DLR implementation steps identified below?

- a) Transmission line identification for DLR system application.
- b) DLR System design
 - i. Field sensors and/or monitoring equipment design including specification, procurement, and installation.
 - ii. Communication infrastructure design, including specification, procurement, and installation.
 - iii. Process coordination between DLR field data and EMS, including any line rating database upgrades or necessary modifications.
 - iv. DLR system integration and testing.
- c) Any other steps needed to implement DLR system.

³² *Id.* P 361.

- Q27) Can any of the steps identified in Q26, be completed concurrently such that the total estimated DLR installation time might be faster than the sum of each step? If so, which steps can be completed concurrently? How might the implementation of Order No. 881 affect the time needed to implement DLR?
- Q28) If, after the initial implementation of DLRs, the transmission provider identifies additional transmission lines that meet the DLR criteria, how long would it take to implement DLRs on those additional transmission lines?
- Q29) If the Commission required DLRs in certain situations based on transmission line criteria, how frequently should transmission owners consider whether additional lines might meet the criteria for DLR implementation? That is, should the Commission require a periodic restudy of transmission systems to determine if additional transmission lines meet the criteria for DLR implementation? Please explain why or why not. If, during a periodic restudy, the transmission provider determines that additional lines meet the criteria for DLR implementation, when should the Commission require the transmission provider to implement DLRs on those additional lines?

III. Comment Procedures

15. The Commission invites interested persons to submit comments on the matters and issues proposed in this NOI, including any related matters or alternative proposals that commenters may wish to discuss. Comments are due **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and Reply Comments are due **[INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Comments must refer to Docket No. AD22-5-000 and must include the commenter's name, the organization they represent, if applicable, and their address.
16. The Commission encourages comments to be filed electronically via the eFiling link on the Commission's web site at <http://www.ferc.gov>. The Commission accepts most standard word-processing formats. Documents created electronically using word-

processing software should be filed in native applications or print-to-PDF format and not in a scanned or picture format. Commenters filing electronically do not need to make a paper filing.

17. Those unable to file electronically may mail comments via the U.S. Postal Service to: Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street NE, Washington, DC 20426. Hand-delivered comments or comments sent via any other carrier should be delivered to: Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, MD 20852.

18. All comments will be placed in the Commission's public files and may be viewed, printed, or downloaded remotely as described in the Document Availability section below. Commenters on this proposal are not required to serve copies of their comments on other commenters.

IV. Document Availability

19. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (<http://www.ferc.gov>). At this time, the Commission has suspended access to the Commission's Public Reference Room due to the President's March 13, 2020 proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19).

20. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this

document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

21. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference

Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

By direction of the Commission.

Issued: February 17, 2022.

Debbie-Anne A. Reese,
Deputy Secretary.